

## AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method for rank ordering characteristic signatures of cell properties, said method comprising the steps of:

forming a plurality of characteristic signatures, each said characteristic signature being formed of values for a particular property having been measured from ~~for a plurality of cell properties having been measured from~~ a plurality of samples taken from a heterogeneous tissue region, wherein the heterogeneous tissue region includes a first portion having at least first and second types of tissue, bordered by a second portion, said second portion considered to be devoid of the second type of tissue, wherein the plurality of samples have been taken from successive locations along a determined profile of locations through the heterogeneous tissue region, with at least one sample being taken from the second portion, and wherein each of said characteristic signatures are formed from different ones of said particular properties, characterizing one of the plurality of ~~properties, respectively;~~

providing a trend profile of a second tissue measured property ~~cell activity~~ for the second type of tissue along the determined profile of locations through the heterogeneous tissue region;

performing statistical analysis on each of the plurality of characteristic signatures with regard to the provided trend profile; and

rank ordering the plurality of characteristic signatures based on proximity to the trend profile as determined by the statistical analysis.

2. (Currently Amended) The method of claim 1, further comprising the step of:

measuring the specific property ~~plurality of cell properties~~ for each of the plurality of samples for at least one of characteristic signatures.

3. (Original) The method of claim 1, further comprising the steps of:

providing the heterogeneous tissue region; and

taking the plurality of samples from the heterogeneous tissue region.

4. (Currently Amended) The method of claim 3, further comprising the step of:

measuring the each specific property ~~plurality of cell properties~~ for each of the plurality of

samples for each respective characteristic signature.

5. (Original) The method of claim 1, wherein the step of forming a plurality of characteristic signatures includes normalizing each of the plurality of characteristic signatures with respect to a baseline reference signature, said baseline reference signature corresponding to a measured property of a sample taken from the second portion.

6. (Original) The method of claim 1, wherein the step of performing statistical analysis includes:

comparing each of the plurality of characteristic signatures with the provided trend profile by curve-fitting to a statistical regression function, wherein said curve-fitting determines the degree of proximity of each of the plurality of characteristic signatures to the provided trend profile.

7. (Original) The method of claim 1, wherein the step of performing statistical analysis includes:

calculating a p-value with regard to each of the plurality of characteristic signatures, to test the null hypothesis between each of the plurality of characteristic signatures and the provided trend profile.

8. (Original) The method of claim 1, wherein the step of performing statistical analysis is done in one-, two- or three-dimensional space.

9. (Original) The method of claim 1, wherein the first type of tissue is healthy tissue.

10. (Original) The method of claim 1, wherein the second type of tissue is diseased tissue.

11. (Currently Amended) The method of claim 1, wherein one of the specific properties ~~plurality of properties~~ is an expression level of a gene.

12. (Currently Amended) The method of claim 2, wherein the step of measuring the specific property comprises measuring different specific properties across the samples to form a plurality of characteristic signatures by ~~a plurality of properties includes~~ processing each of the plurality of

samples using a microarray technique.

13. (Currently Amended) The method of claim 13, wherein said processing comprises 2,  
~~wherein the step of measuring a plurality of properties includes:~~ processing each of the plurality of  
samples on a single two-color microarray, two single-color microarrays or both.

Claims 14 - 16. (Canceled)

17. (Currently Amended) A computer readable medium carrying one or more sequences of  
instructions for rank ordering characteristic signatures of ~~cell~~ properties measured from a plurality of  
samples taken from a heterogeneous region, wherein a first portion of the heterogeneous tissue region  
has at least first and second types of tissue and is bordered by a second portion of the heterogeneous  
tissue region, wherein the second portion is considered to be devoid of the second type of tissue, and  
wherein the plurality of samples have been taken from successive locations along a determined  
profile of locations through the heterogeneous tissue region, with at least one sample being taken  
from the second portion, wherein execution of one or more sequences of instructions by one or more  
processors causes the one or more processors to perform the steps of:

forming a plurality of characteristic signatures, each said characteristic signature being  
formed of values for a particular property having been measured from the plurality of samples ~~for a~~  
~~plurality of cell properties having been measured from a plurality using the measured plurality of~~  
~~properties, each of said characteristic signatures characterizing one of the plurality of properties,~~  
respectively;

providing a trend profile of a second tissue measured property of cell activity ~~for the second~~  
type of tissue along the determined profile of locations through the heterogeneous tissue region;

performing statistical analysis on each of the plurality of characteristic signatures with regard  
to the provided trend profile; and

rank ordering the plurality of characteristic signatures based on proximity to the trend profile  
as determined by the statistical analysis.

18. (Currently Amended) A system for rank ordering characteristic signatures of ~~cell~~  
properties generated from tissue samples taken from a heterogeneous tissue region, wherein a first  
portion of the heterogeneous tissue region has at least first and second types of tissue and is bordered

by a second portion of the heterogeneous tissue region, wherein the second portion is considered to be devoid of the second type of tissue, the system comprising:

means for providing a trend profile of a second tissue measured property of cell activity for the second type of tissue along a determined profile of locations through the heterogeneous tissue region from which tissues samples are taken as the sources of the characteristic signatures;

means for performing statistical analysis on each of the plurality of characteristic signatures with regard to the provided trend profile; and

means for rank ordering the plurality of characteristic signatures based on proximity to the trend profile as determined by the statistical analysis.

19. (Currently Amended) The system of claim 18, further comprising

means for forming the plurality of characteristic signatures based on measurements of values for a particular property measured from the plurality of samples ~~a plurality of properties characteristic of the tissues~~, each of said characteristic signatures formed from values for a particular property different from the particular properties measured to form others of the characteristic signatures ~~related to a corresponding one of the plurality of properties~~.

20. The system of claim 18, further comprising:

means for measuring at least one said specific property ~~the plurality of properties~~ for each of the plurality of samples.

Claims 21-34. (Canceled)